Please add new claims 75-94 as follows.

75. A system for obtaining mass data comprising:

a mass spectrometer comprising an ion source chamber, wherein the ion source chamber comprises

a sample receiving stage adapted to support a sample support, and

a mechanism to move the sample receiving stage in an x direction and in a y direction perpendicular to the x direction, wherein the x direction and the y direction lie substantially in the same plane;

a laser source in optical communication with the ion source chamber, wherein the laser source is adapted to provide a laser pulse to a sample support in the ion source chamber;

a vacuum lock chamber connected with the ion source chamber, wherein the vacuum lock chamber comprises a sample support holder adapted to support more than one sample support; and

a sample support transfer mechanism adapted to:

(a) disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber to the vacuum lock chamber and to associate the first sample support with the sample support holder; and

(b) disassociate a second sample support from the sample support holder, transport the second sample support from the vacuum lock chamber to the ion source chamber and to associate the second sample support with the sample receiving stage;

wherein the vacuum lock chamber and ion source chamber are in fluid communication and are maintained under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports.

76. The system of claim 75 further comprising an electronic control mechanism to control at least the mechanism to move the sample receiving stage.

77. The system of claim 76 wherein the electronic control mechanism comprises a computer.

78. The system of claim 75 wherein the laser source is adapted to provide a laser pulse to irradiate a sample on a sample support.

79. The system of claim 75 wherein the sample support holder comprises a cassette adapted to hold a plurality of sample supports.

80. The system of claim 75 further comprising a sample support.

81. The system of claim 80 wherein the sample support comprises a plurality of samples each disposed at fixed locations on the sample support.

82. The system of claim 81 wherein the sample support further comprises a location identifier associated with at least one of the fixed locations.

83. The system of claim 75 further comprising a door member positioned between the ion source chamber and the vacuum lock chamber.

84. The system of claim 75 further comprising a vacuum pump independently associated with the vacuum lock chamber.

85. The system of claim 75 further comprising a sample preparation system associated with the vacuum lock chamber, wherein the sample preparation system is adapted to deliver a plurality of samples to a sample support prior to introduction to the vacuum lock chamber.

86. The system of claim 85 wherein the sample preparation system comprises a sample loading mechanism adapted to position each of a plurality of liquid samples on a sample support.

87. The system of claim 86 wherein the sample preparation system further comprises a sample curing chamber to dry each of the plurality of liquid samples on a sample support.

88. The system of claim 75 further comprising a sample storage chamber connected to the vacuum lock chamber, wherein the sample storage chamber comprises a sample support storage holder adapted to support at least one sample support.

Date Entered: 05/25/2004

89. The system of claim 88 further comprising a sample support storage transfer mechanism adapted to move a sample support from the sample storage chamber to the vacuum lock chamber.

90. A system for obtaining mass data comprising:

a mass spectrometer comprising an ion source chamber, wherein the ion source chamber comprises

a sample receiving stage adapted to support a sample support, and

a mechanism to move the sample receiving stage;

a laser source in communication with the ion source chamber, wherein the laser source is adapted to provide a laser pulse to a sample support in the ion source chamber;

a vacuum lock chamber connected with the ion source chamber;

a sample storage chamber connected to the vacuum lock chamber, wherein the sample storage chamber comprises a sample support holder adapted to support at least one sample support; and

a sample support transfer mechanism adapted to:

(a) disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber to the vacuum lock chamber and to associate the first sample support with the sample support holder; and

(b) disassociate a second sample support from the sample support holder, transport the second sample support from the vacuum lock chamber to the ion source chamber and to associate the second sample support with the sample receiving stage;

wherein the vacuum lock chamber and ion source chamber are in fluid communication and are maintained under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports.

91. The system of claim 90 wherein the mechanism to move the sample receiving stage is adapted to move the sample receiving stage in an x direction and in a y direction perpendicular to the x direction.

92. A method of obtaining mass data comprising the steps of:

supporting each of a plurality of samples at a fixed location on one of a plurality of sample supports;

providing an ion source chamber having a sample receiving stage adapted to support a sample support;

providing a vacuum lock chamber adapted to maintain one or more of the sample supports within a vacuum controlled environment while a sample on another of the sample supports is struck by a laser pulse,

wherein the vacuum lock chamber comprises a sample support holder adapted to receive the plurality of sample supports;

moving a first sample support associated with the sample receiving stage within the ion source chamber in an x direction and in a y direction perpendicular to the x direction;

striking with a laser pulse a desired number of the plurality of samples on the first sample support within the ion source chamber to desorb and ionize sample molecules;

disassociating the first sample support from the sample receiving stage;

transporting the first sample support from the ion source chamber to the vacuum lock chamber;

associating the first sample support with the sample support holder;

disassociating a second sample support from the sample support holder;

transporting the second sample support from the vacuum lock chamber to the ion source chamber;

associating the second sample support with the sample receiving stage;

moving the second sample support associated with the sample receiving stage within the ion source chamber in an x direction, and in a y direction perpendicular to the x direction; and

striking with a laser pulse a desired number of the plurality of samples on the second sample support within the ion source chamber to desorb and ionize sample molecules.

B2